

# BATTLETECH

## CENTER







## BATTLETECH - CENTER



Virtual World Entertainments, Inc.'s BattleTech Center is an entertainment center which simulates a fictional universe. It is the world's first multi-player, interactive, real-time simulator allowing people to exist and interact in a "virtual world." A virtual world is a computer-generated world that can be explored from a first-person point of view.

This concept was developed over the past eight years. The first center was opened August 1, 1990, at Chicago's North Pier, 435 East Illinois Street.

The decor of the reception area, as you walk in, is futuristic but simple. The fixed props are deliberately not specific to BattleTech because, from the beginning, it was envisaged that BattleTech would be only the first of a series of such fantasy environments to be offered by such a center. However, the batteries of TV monitors in the reception area have newscasts and scenes from the BattleTech world constantly showing, to create an immediate impression of this fantasy world as soon as people walk in the door.



COMMAND CENTER is where customers purchase tickets or make reservations to play at a later date.

Because the Center is configured for teams of four people to play against each other, the receptionist will match up people to create teams, and will introduce them to each other. However, it is already becoming clear that many people will come as complete teams. Likewise, early experience suggests that the center may be booked up well ahead—a day or more—at peak times such as 6-9 p.m. At quieter times, however, walk-in people should be able to play fairly quickly. While waiting for their turn, players may wander around the shops, get a drink at a nearby bar, or sit in the observation room to watch on the screens the course of the battles underway at that time.

Books and games relating to BattleTech, operational manuals, videotapes of the individual players games and other BattleTech paraphernalia are all available for sale at the Command Center.



B A T T L E T E C H • C E N T E R



# THE LAUNCH BAY





On the OBSERVATION DECK, visitors to the BattleTech Center at North Pier Chicago get prepped as they await their experience.

This area is decorated as a wardroom of a giant starship. TV monitors fill up a wall, some broadcasting newscasts explaining the political situations of the 31st century. Most monitors are repeaters of the players cockpit monitors, each labeled with the player's name. This way the observers can watch the game unfold from all eight players' points of view.

In the READY AREA, the players prepare for their mission. A uniformed officer shows them their briefing computer, describes their mission, the opposition, the terrain and weather conditions, and other relevant information. There are hundreds of different mission permutations available, so it is up to the duty staff to match the difficulty of the mission to the experience of the teams. The officer will also obtain each player's choice of the type of vehicle he wants to fight in, so that the equipment can be pre-programmed accordingly.

Here, the players get an explanation of how to operate the cockpit from an instructional videotape. They can scope the terrain of their mission and obtain information on the universe through a "user-friendly" computer, finding out everything about their vehicles and their enemy's vehicles. With this information, the players form a strategy on how to accomplish their mission, which may vary from game to game.

The officer will also be available to guide beginners. Otherwise, the team is then given ten minutes to work out their battle strategy.

When their session is about to begin, the players are led into the Launch Bay. There, rows of cockpits await them in two areas, Alpha Game and Omega Game. Each cockpit has the name of the player on an electronic display over it. The player seats himself in the cockpit and slides the canopy closed, at which point he is cut off from the outside world except for voice communication via the radio with the rest of the team.



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The Cockpit (10 ft. x 3-1/2 ft. x 5 ft.) contains over 100 controls and displays. Beginning players need only use a few of these, using more as they progress. Inside the cockpit, each player is limited to his/her own view of the "virtual world" outside the video window via a 25" color monitor. A secondary screen shows radar and other detection systems—as well as real-time information about the BattleMech, such as damage sustained, dangerous heat build-ups, etc.

On the left is a forward/reverse throttle, and on the right a joystick with triggers and buttons that control the different weapons systems. Panels of switches control which weapons are on which buttons, allowing the experienced player to set the machine up to his personal preferences, although for beginners it is easier to put everything on a single trigger.

The machine is steered like a battletank, with two floor pedals for turning left or right. There are numerous other controls, with rocker switches and lights overhead. Players are also surrounded by speakers that greatly increase the sense of reality by transmitting the noises of the machine and the commotion of the battle. The entire capsule seems to shake when the BattleMech is hit.

Play commences with the bay doors on the main screen opening, revealing the bleak terrain over which the teams will fight. Push-

ing the thrust lever forward, the player moves out into this fantasy world with his team alongside. Short-range radar helps to maintain formation—and later to guide players in battle—and longer-range radar monitors where the opposition is. On both systems, enemy units are easily distinguishable from friendly units; when a unit is caught in the cross-hairs, the identity of the player flashes on the screen, as well as range information.

For the next ten minutes, everything is completely interactive in real-time, and the course of play is dictated by the different actions of eight independent players. Nothing is predictable, and everything depends on the skill of the opposing players. Each machine will suffer progressive performance deterioration as it is hit. The degree of damage is determined by the destructive power of the weapon used, the thickness of the armor at the impact point, and the extent to which previous damage had been sustained at that point. The systems are extremely specific in capturing the strengths and weaknesses of different types of BattleMechs and weaponry.

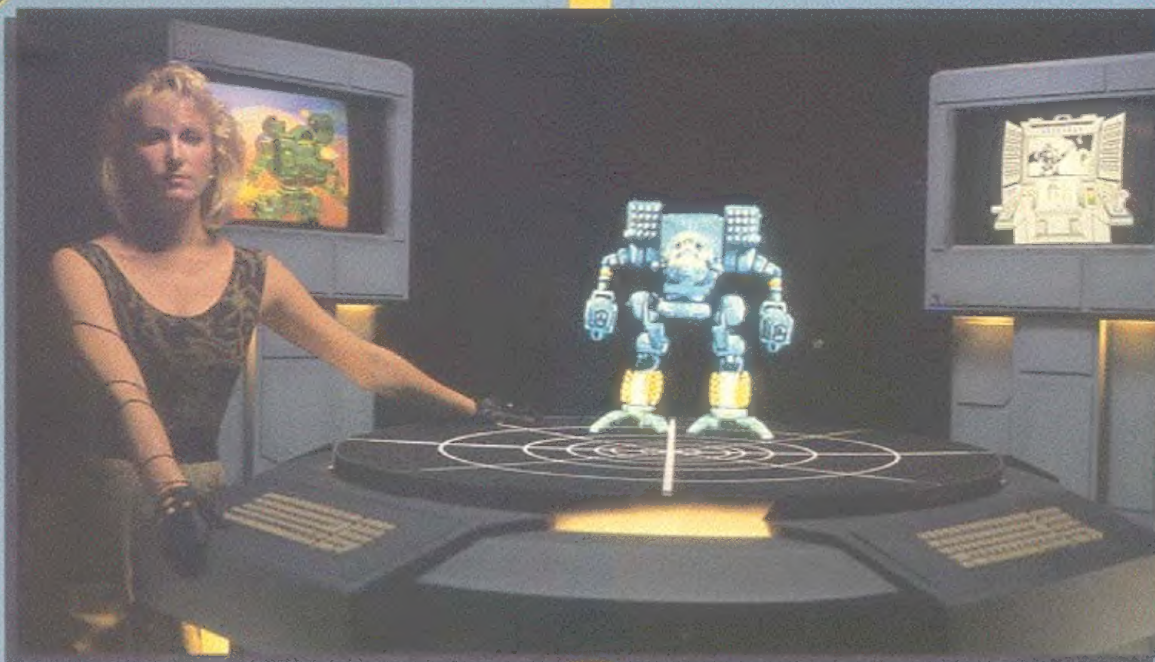
Additional layers of complexity are added by heat build-up (caused by excessive speed or weapon usage) that slows the machine down until the heat can dissipate, and also by switching to night-fighting. Players may also shut off their radar so that they can only be "seen" at close quarters with heat sensors.







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The ten minutes of play is a very intense experience, regardless of the skill level of the player. For a beginner, it is somewhat intimidating, but extremely exciting. For the more experienced, it appears to be quite exhilarating and addictive. Talking to people as they emerge from their session—or just listening to them talking among themselves—the extent to which they have been caught up in the whole experience is self-evident.

It should be noted that the typical age group of players coming through so far is 17-35 year olds, not the younger group upon which traditional arcade games have depended. While it is assumed that virtual-world entertainment will also appeal strongly to teenagers, it is aimed at a more sophisticated age group—one with considerably greater spending power.

The "virtual-world" technology used in BattleTech Center was conceived and designed by Virtual World Entertainments Inc.

after an eight-year evolution that started in the minds of inventors and company founders Jordan Weisman and L. Ross Babcock III.

The BattleTech software integrates graphics, sound, and story information among the individual players in each pod via a local area network.

Virtual World Entertainments Inc. created four proprietary computers for managing and displaying the graphics and sound used in the game. The computers are founded on the same technological concepts that military flight simulators employ.

Each cockpit's computers use over 32 megabytes of RAM memory and communicate with other cockpits via a local area network. The cockpit's main screen graphic display is capable of full real-time scaling, with each computer keeping an accurate mathematical model of the environment, each object, its placement status, and the view which would be seen from any given place.



## BATTLETECH CENTER Technical Specifications

Each cockpit contains 26 proprietary PC boards, which make up the graphic, sound and cockpit control and display systems.

### The Graphic System

Each cockpit contains two viewing screens: the primary "out the front window" screen and a secondary screen used for radar, and other information screens.

Virtual World Entertainments, Inc. (VWE) designed the primary screen graphic system differently than most military-type simulators, which model the on-screen universe via a set of polygons, and then calculate the entire display from each person's point of view. To create a realistic graphic requires an enormous number of polygons and thus requires an incredibly fast math engine, which is cost-prohibitive to all but military applications.

The BattleTech Center graphics system uses 19,000 pre-drawn "arted" images which are stored in each cockpit's 32-megabyte RAM memory and then called to the screen as needed. This system limits some movement possibilities but brings the cost of the system down to the reach of the general public. The images are originally created on a computer-aided design system, and then rendered using ray tracing, shading, source lighting, and edge smoothing.

The two features that really separate the VWE system from other real-time graphic systems are its geometry engine and its use of palette manipulation. The geometry engine performs hardware scaling of the images in real time and also allows the two-dimensional transformations such as mirroring, warping, flips, and keystoneing. This versatile, fast engine makes the 19,000 graphic images go a lot further.

As each object is placed on-screen, it is assigned a color palette which consists of 256 colors. Palettes are assigned based on the object type, location, and situation. An example of this palette use is distance haze. In the real world, as an object gets farther away, it tends to blend into the background. This reality is not usually shown in simula-







tors, but the VVE system reflects this by assigning a series of palettes to the object as it moves off into the distance. Each successive palette shares more and more colors in common with the background, and the object starts to blend into the distance.

**Primary Screen:**

Screen resolution: 320 x 200  
Maximum colors on screen: 64,000  
Total color palette: 16 million colors  
System memory: 34.5 Megabytes of RAM, expandable to 130.5 Megabytes  
Graphic images in memory: 19,000  
Special geometry engine: hardware scaling of graphic images and performs two dimensional transformations, mirrors, warping, flips, keystoneing.

**Secondary screen:**

Screen resolution: 320 x 200  
Colors per screen: 16  
Total color palette: 4096

**The sound system:**

The sound system incorporates three sound-generation devices, giving it the ability to generate spatially oriented sounds from either straight sampled sounds, sampled sounds with frequency control, or FM-synthesized sounds.

Four speakers surround the player with an additional large sub-woofer in the seat. This speaker arrangement allows the VVE sound system to place a specific sound effect anywhere around the player in two-dimensional space.

**The cockpit controls:**

Each cockpit has close to a hundred controls and over a hundred indicator lights. They are as follows:

- 1 Eight-position joystick, containing three firing buttons
- 1 Analog throttle
- 2 Analog foot pedals
- 52 Momentary switches
- 8 Momentary rocker switches
- 1 16 button keypad
- 1 32-segment LCD bar-graph
- 128 14-segment LED alpha-numeric display